National Earthquake Hazards Reduction Program

… a research and implementation partnership

Program Overview

Advisory Committee on Earthquake Hazards Reduction

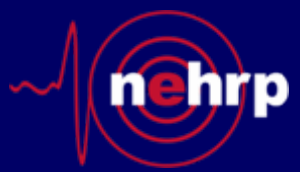
10 May 2007

Dave Applegate, USGS

Jack Hayes, NEHRP Director, NIST

Ed Laatsch, DHS FEMA

Joy Pauschke, NSF



FEMA

NIST National Institute of Standards and Technology

USGS science for a changing world

national earthquake hazards reduction program

Presentation Outline

- Background
- 2004 Reauthorization (P.L. 108-360) Review
- Interagency Coordinating Committee
- Advisory Committee on Earthquake Hazard Reduction
- Annual Report
- Budget
- *First Year Activity (Discussed Throughout Presentation)*
- Strategic Plan
- Management Plan
- Ongoing Synergistic Efforts *(That Have Not Been Mentioned Elsewhere)*
- Conclusion

Reauthorization Background

- Public Law (PL) 95-124, the *Earthquake Hazards Reduction Act of 1977*, established NEHRP.
- NEHRP is Federal Government's long-term program to reduce U.S. earthquake risks.
- NEHRP *authorizes* appropriation levels for four principal agencies – FEMA, NIST, NSF, USGS.
- Congress typically reviews and reauthorizes NEHRP every 2-5 years – traditionally led by House Committee on Science and Technology.

PL 108-360

NEHRP Reauthorization Act of 2004

Overview

- Most recent reauthorization - enacted 25 October 2004.
- Followed two-year review of NEHRP, including hearings by House Science Research Subcommittee and Senate Space, Science, and Transportation Subcommittee.
- Observed that new mitigation technologies are being implemented slowly, while urban development has accelerated, resulting in significantly increased societal vulnerabilities.
- Reauthorized NEHRP for FY 2005 – FY 2009 at average annual totals (for all 4 agencies) of ~ $180M, an increase of $75M per year from previous levels.

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Statutory "Program Activities"

- Improve understanding of earthquakes and their effects on communities, buildings, structures, and lifelines, through interdisciplinary research involving engineering, natural sciences, and social, economic, and decisions sciences.
- Develop effective measures for earthquake hazards reduction.
- Promote adoption of earthquake hazards reduction measures by Federal, State, & local governments; national standards & model code organizations; architects and engineers; building owners, and others with a role in planning and constructing buildings, structures, and lifelines through:
  - grants, contracts, cooperative agreements, and technical assistance;
  - developing standards, guidelines, and voluntary consensus codes for earthquake hazards reduction for buildings, structures, & lifelines;
  - developing and maintaining a repository of information, including technical data, on seismic risk & hazards reduction.
- Develop, operate, and maintain Advanced National Seismic Research and Monitoring System; *George E. Brown, Jr.* Network for Earthquake Engineering Simulation; and Global Seismographic Network.

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NEHRP Agency Roles

Department of Homeland Security

Federal Emergency Management Agency (FEMA)

- **Promote** (with NIST) **implementation of research results** by working closely with national standards and model building code organizations.

- **Promote better building practices** within the building design & construction industry (architects, engineers, contractors, builders, & inspectors).

- **Operate program of grants & assistance** to enable States to develop mitigation, preparedness, & response plans; prepare inventories & conduct seismic safety inspections of critical structures & lifelines; update building & zoning codes & ordnances to enhance seismic safety, increase earthquake awareness and education, and encourage development of multi-state groups for such purposes.

- **Support implementation of a comprehensive earthquake education and awareness program,** including development of materials and their wide dissemination to all appropriate audiences and support public access to locality-specific information that may assist the public in preparing for, mitigating against, responding to, and recovering from earthquakes and related disasters.

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NEHRP Agency Roles

FEMA, continued

- Assist NIST, other Federal agencies, & private sector groups, in the preparation, maintenance,& wide dissemination of seismic resistant design guidance and related information on building codes, standards, and practices for new and existing buildings, structures, and lifelines; & aid in the development of performance-based design guidelines & methodologies supporting model codes for buildings, structures, & lifelines that are cost-effective and affordable.

- Develop, coordinate, & execute the National Response Plan when required following an earthquake, & support the development of specific State and local plans for each high risk area to ensure the availability of adequate emergency medical resources, search & rescue personnel & equipment, & emergency broadcast capability.

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NEHRP Agency Roles

FEMA, continued

- Develop approaches to combine measures for earthquake hazards reduction with measures for reduction of other natural and technological hazards, including performance-based design approaches.

- Provide preparedness, response, and mitigation recommendations to communities after an earthquake prediction has been made.

- Enter into cooperative agreements or contracts with States & local jurisdictions, and other Federal agencies to establish demonstration projects on earthquake hazard mitigation, to link research & mitigation efforts with emergency management programs, or to prepare educational materials for national distribution.

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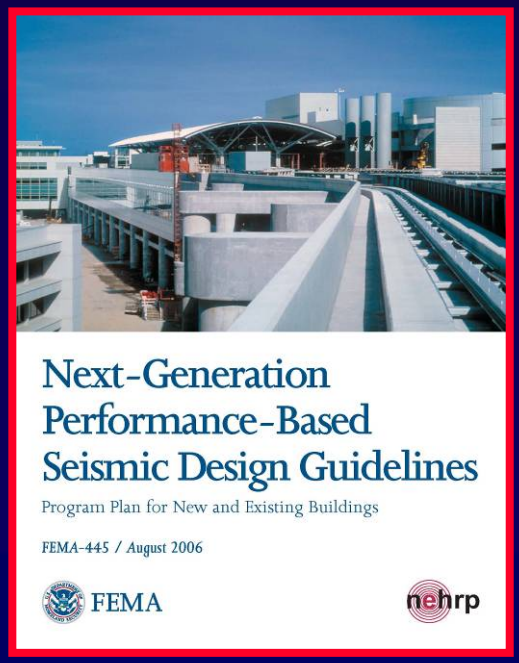
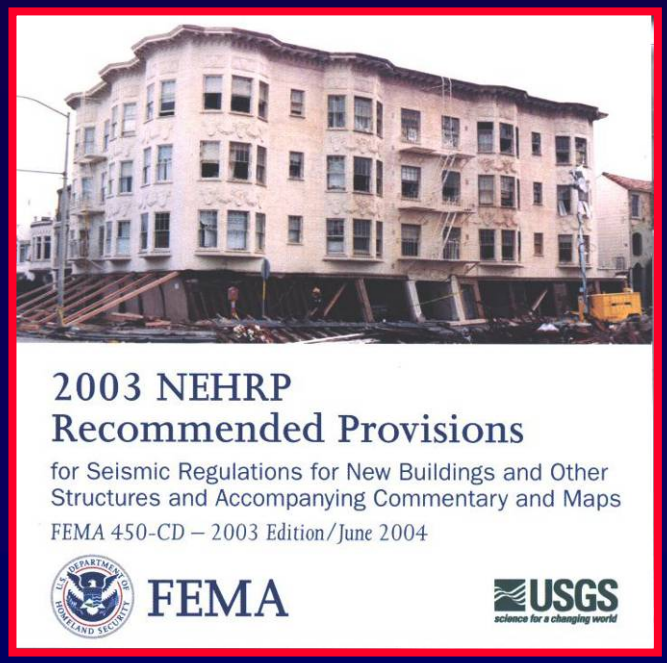
NEHRP Agency Roles

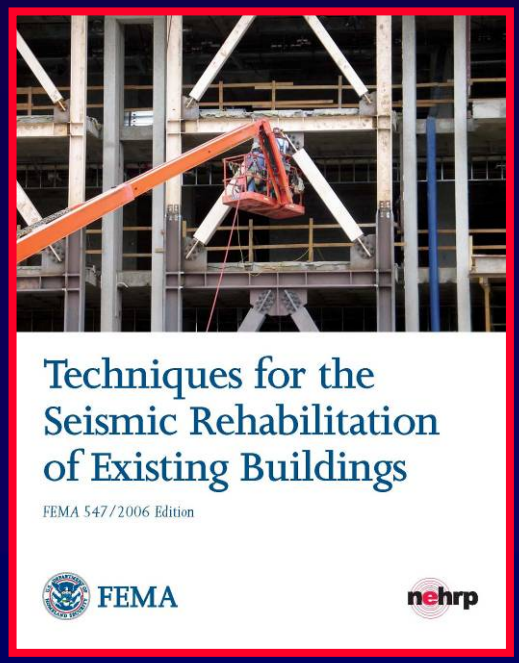
Recent Typical FEMA Activities



Ongoing efforts involve all NEHRP agencies



Joint effort with USGS (seismic hazard mapping).



Cooperative effort with NIST.

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NEHRP Agency Roles

National Institute of Standards and Technology (NIST)

Lead Agency

Responsible for program planning & coordination.

- Ensure that program includes necessary steps to promote implementation of earthquake hazard reduction measures by Federal, State, and local governments, national standards & model building code organizations, architects and engineers, and others with roles in planning & constructing buildings & lifelines.

- Support development of performance-based seismic engineering tools, & work with appropriate groups to promote commercial application of such tools, through earthquake-related building codes, standards, and construction practices.

- Request assistance of Federal agencies other than the Program agencies, as necessary to assist in carrying out the (Program).

- Work with FEMA, NSF, & USGS, to develop a comprehensive plan for earthquake engineering research to effectively use existing testing facilities and laboratories, upgrade facilities & equipment as needed, & integrate new, innovative testing approaches to the research infrastructure in a systematic manner.

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NEHRP Agency Roles

NIST, continued

- Work closely with national standards and model building code organizations, in conjunction with FEMA, to promote implementation of research results.

- Promote better building practices among architects and engineers.

- Work closely with national standards organizations to develop seismic safety standards and practices for new and existing lifelines.

- Support development & commercial application of cost-effective and affordable performance-based seismic engineering by providing technical support seismic engineering practices & related building codes, standards, & practices development.

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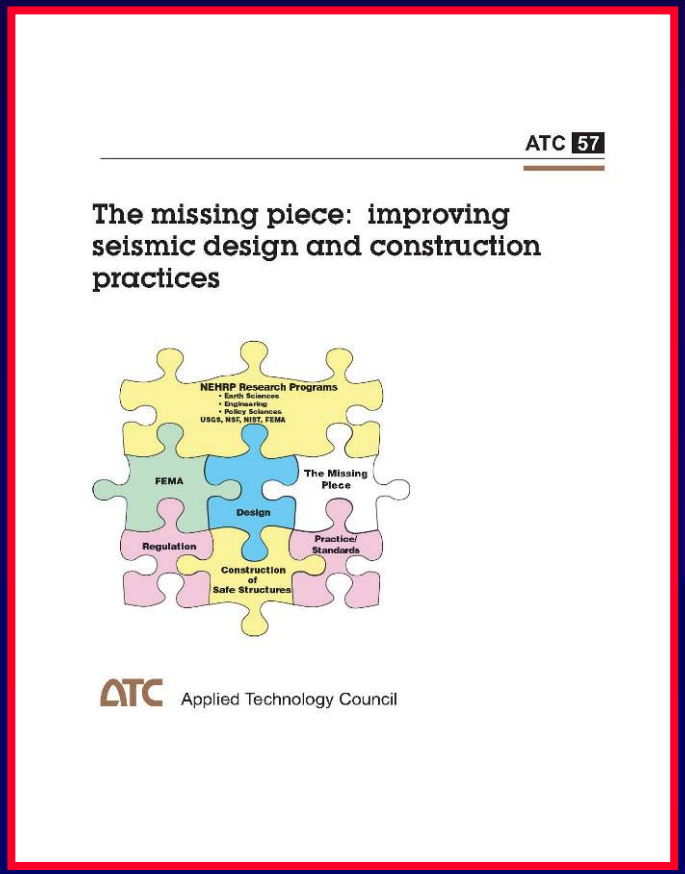
NEHRP Agency Roles

NIST: *Perform problem-focused research!*



President's *American Competitiveness Initiative* re-energizes NIST earthquake research program!

- FY 2007 budget started process (+$800K from FY 2006).
- Requested FY 2008 budget strengthens commitment (+$5.5M from FY 2006).

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NEHRP Agency Roles

National Science Foundation (NSF)

- Fund (fundamental) research on earth sciences to improve understanding of causes & behavior of earthquakes, earthquake engineering, & human response to earthquakes. Note: *Earthscope* is maintained as a related non-NEHRP activity.

- Encourage prompt dissemination of significant findings, sharing of data, samples, physical collections, & other supporting materials, & development of intellectual property so research results can be used by appropriate organizations to mitigate earthquake damage.

- In addition to supporting individual investigators, support university research consortia & centers for research in geosciences & in earthquake engineering.

- Work closely with USGS to identify geographic regions of national concern that should be the focus of targeted solicitations for earthquake-related research proposals.

- Support research that improves the safety & performance of buildings, structures, & lifeline systems using large-scale experimental and computational facilities of the (George E Brown, Jr) Network for Earthquake Engineering Simulation (NEES) & other institutions engaged in research & implementation of NEHRP.

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NEHRP Agency Roles

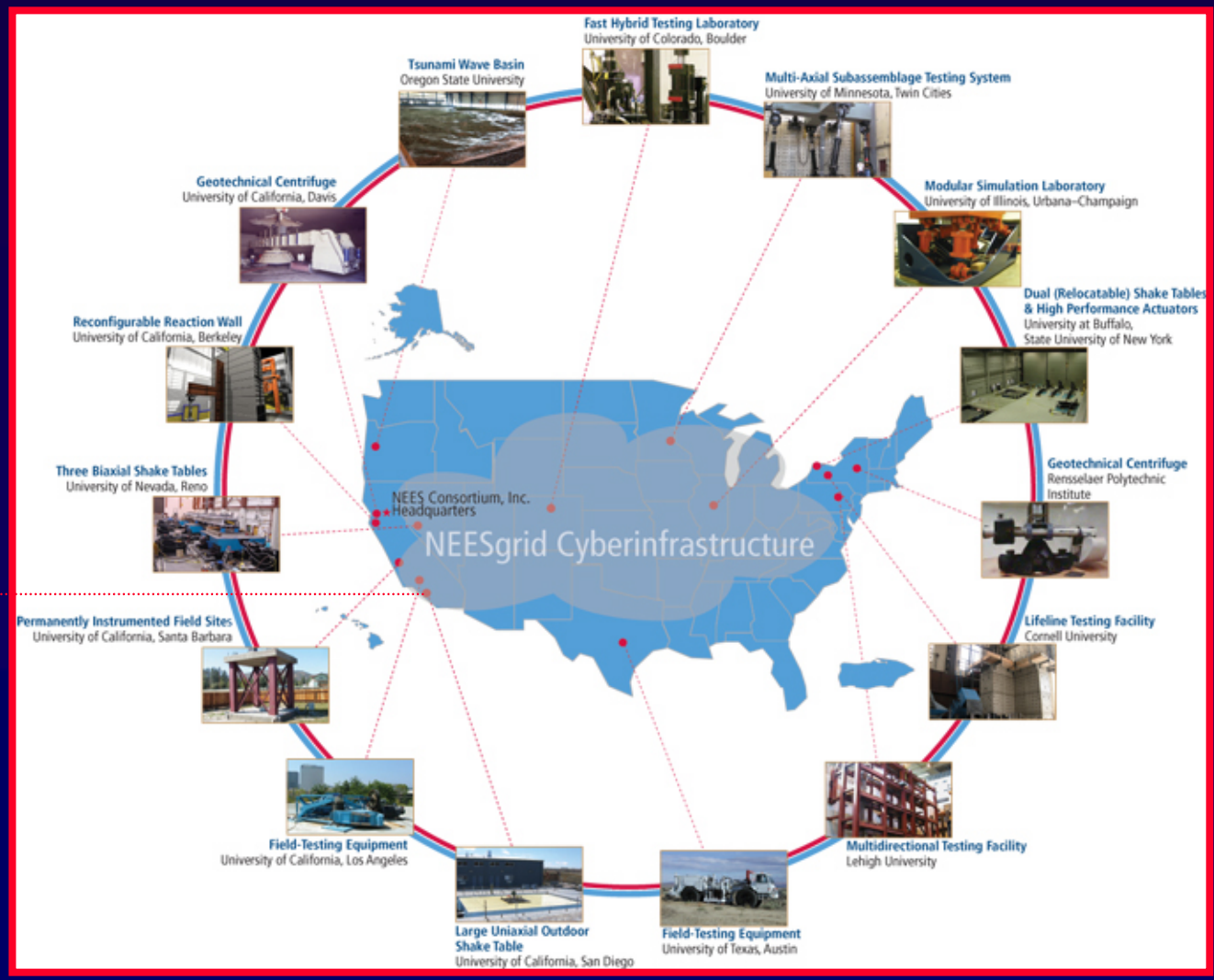
NSF, continued

- Emphasize in earthquake engineering research, development of economically feasible methods to retrofit existing buildings and protect lifelines to mitigate earthquake damage.
- Support research that studies the political, economic, & social factors that influence the implementation of hazard reduction measures.
- Include to the maximum extent practicable diverse institutions, including HBCUs and those serving large proportions of (minorities) and other underrepresented populations.
- Develop in conjunction with FEMA, NIST, & USGS, a comprehensive plan for earthquake engineering research to effectively use existing testing facilities and laboratories, upgrade facilities & equipment as needed, & integrate new, innovative testing approaches to the research infrastructure in a systematic manner.

NEHRP Agency Roles: NSF and NEES

NEES Shared Use Infrastructure

[Operated by NEES Consortium, Inc.]

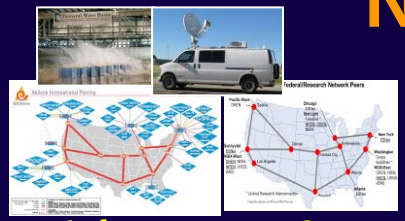


NEESit: San Diego Supercomputer Center @ UCSD

nehrp

national earthquake hazards reduction program

NEES Cyberinfrastructure



Infrastructure & middleware

DAQ Systems, networks, storage, servers, security, middleware

Community databases & data collections

Data management, sharing, queries, mining and preservation

webex

INTERNET2

Collaboration

NEES Consortium, NEESit, researchers, students, equipment sites, practitioners

Simulation

HPC allocations, community codes, hybrid simulation, and modeling

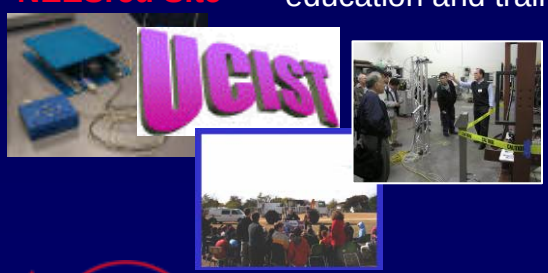
Software

Web services, tools, telepresence, and applications

NEESreu Site

Education

Earthquake engineering education and training



Global

Facilities and cyber

Leveraging

Collaboration and community leadership with other large-scale projects

NMI

GEON
The Geosciences Network

earthscope
PROJECT

neon

ANSS

nehrp

national earthquake hazards reduction program

NEHRP Agency Roles: NSF and Centers

Mid-America Earthquake Center
Assessment, Mitigation, Response & Recovery

MCEER
EARTHQUAKE ENGINEERING TO EXTREME EVENTS

PEER
PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

NATURAL HAZARDS CENTER

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NEHRP Agency Roles

U.S. Geological Survey (USGS)

- Conduct research & other activities necessary to characterize and identify earthquake hazards, assess earthquake risks, monitor seismic activity, and improve earthquake predictions.

- Conduct a systematic assessment of seismic risks in each region of the Nation prone to earthquakes, including, where appropriate, the establishment and operation of intensive monitoring projects on hazardous faults, seismic microzonation studies in urban & other developed areas where earthquake risk is determined to be significant, & engineering seismology studies.

- Work with officials of State & local governments to ensure that they are knowledgeable about specific seismic risks in their areas.

- Develop standard procedures, in consultation with the Director of FEMA and Director of NIST, for issuing earthquake predictions, including aftershock advisories.

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NEHRP Agency Roles

USGS, continued

- Issue, when necessary, and notify the Director of FEMA and Director of NIST, an earthquake prediction or other earthquake advisory, which may be evaluated by the National Earthquake Prediction Evaluation Council.

- Operate, using the National Earthquake Information Center (NEIC), a forum for the international exchange of earthquake information.

- Operate a National Seismic System (ANSS).

- Support regional seismic networks, which shall complement the National Seismic Network.

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NEHRP Agency Roles

USGS, continued

- Work with NSF, FEMA, & NIST, to develop a comprehensive plan for earthquake engineering research to effectively use existing testing facilities and laboratories, upgrade facilities & equipment as needed, & integrate new, innovative testing approaches to the research infrastructure in a systematic manner.

- Work with other Program agencies to coordinate Program activities with similar earthquake hazards reduction efforts in other countries.

- Maintain suitable seismic hazard maps in support of building codes for structures and lifelines, including additional maps needed for performance-based design approaches.

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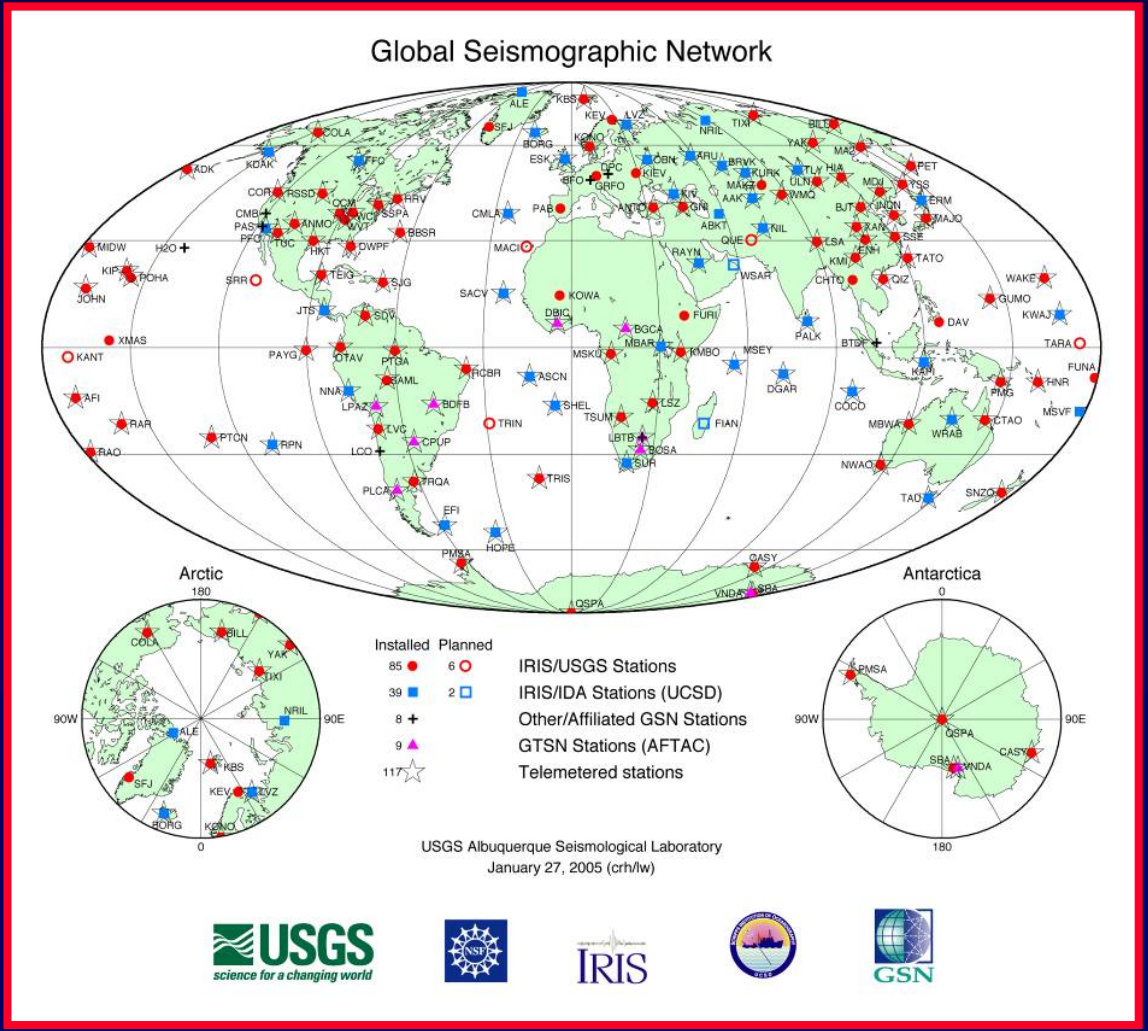
NEHRP Agency Roles: USGS

Unique Geoscience and Seismology Initiatives

GSN is jointly supported by NSF & USGS, as well as the Incorporated Research Institutions for Seismology (IRIS)!



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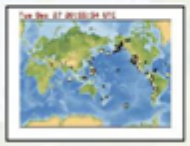
NEHRP Agency Roles: USGS

Unique Geoscience and Seismology Initiatives

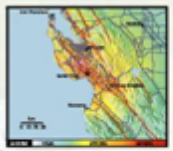
ANSS is jointly supported by NSF & USGS and will ultimately also be used by NIST & FEMA!

ANSS Earthquake Information Products & Tools

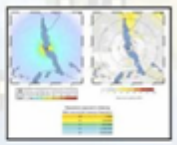


Latest Earthquakes
Maps and information for U.S. and worldwide earthquakes within minutes after they occur.
http://earthquake.usgs.gov/eqcenter/

Earthquake Notification
Customizable earthquake information automatically sent to your wireless device or email account.
http://earthquake.usgs.gov/ens/



ShakeMaps
Distribution of shaking from an earthquake anywhere in the world within minutes.
http://earthquake.usgs.gov/shakemap/



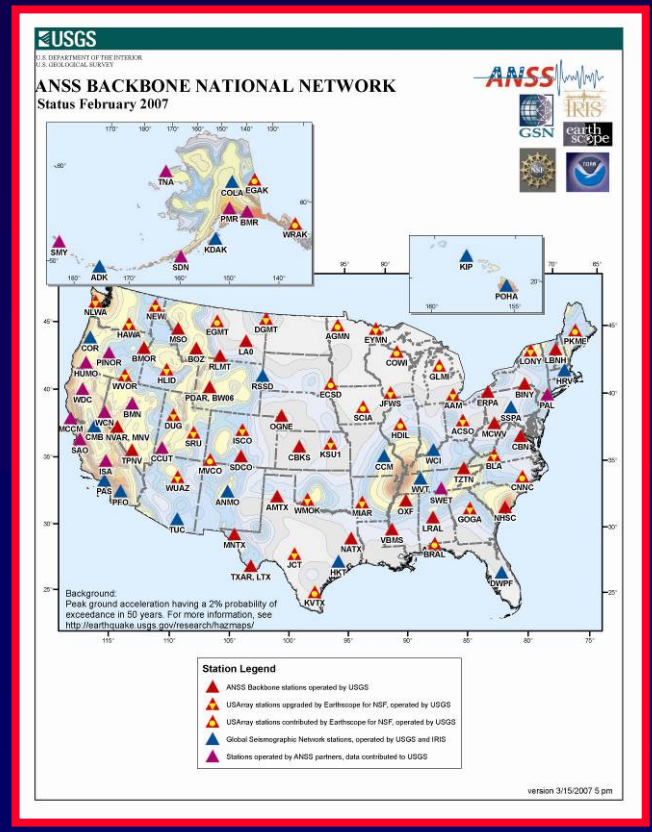
PAGER
Estimates of population exposure to significant earthquake shaking anywhere in the world within minutes.
http://earthquake.usgs.gov/pager/

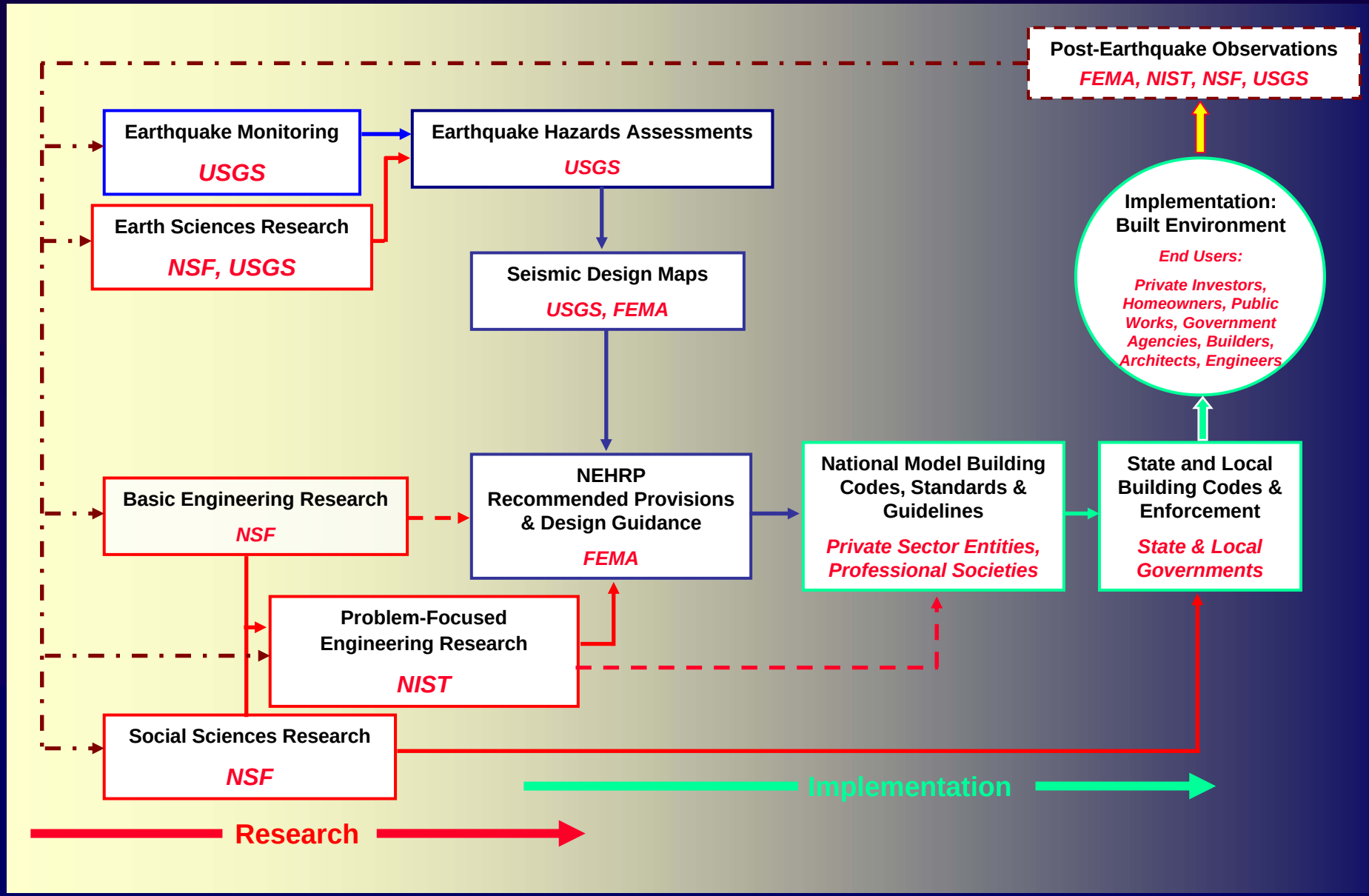
Realtime Feeds & Data
Real-time earthquake data in a variety of formats including RSS, CAP, CSV, and KML.
http://earthquake.usgs.gov/eqcenter/feeds_data.php

Did You Feel It?
Citizen science webpage where shaking intensity maps are created by the people who felt the earthquake.
http://earthquake.usgs.gov/dyfi/

ShakeCast
Automated ShakeMap delivery, damage assessment, and notification for critical lifeline operators.
http://earthquake.usgs.gov/resources/software/shakecast/

CISN Display
Downloadable software to visualize and receive notifications for seismicity anywhere in the world on your computer
http://www.cisn.org/software/cisndisplay.html





NEHRP Impact on the Built Environment

national earthquake hazards reduction program

PL 108-360

Major Technical Priorities

PL 108-360 endorsed priorities identified in 2001-2005 NEHRP *Strategic Plan*, which was developed in partnership with the stakeholder community (private sector, state & local governments, & academia):

- Development and commercial application of performance-based seismic engineering tools, codes, standards, and practices (FEMA, NIST).
- Completion of USGS Advanced National Seismic System (ANSS).
- Operation and maintenance of and conduct of research using NSF George E. Brown, Jr., Network for Earthquake Engineering Simulation (NEES).
- Operation and maintenance of Global Seismographic Network (GSN) by USGS & NSF.

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Leadership & Management Priorities

- NIST designated as Lead Agency.
- Interagency Coordinating Committee.
- Advisory Committee on Earthquake Hazards Reduction.
- Updated Strategic Plan.
- Management Plan.
- Coordinated interagency budget and Annual Report to Congress.

Interagency Coordinating Committee (ICC)

- Directors of FEMA, NIST (Chair), NSF, & USGS, Office of Science & Technology Policy (OSTP), and Office of Management & Budget (OMB).
- Oversees planning, management, & coordination.
- Responsible for developing and updating strategic and management plans, coordinated interagency budgets, and annual program reports.
- Status:
  - Three meetings held thus far (April, July, October 2006).
  - Meeting 4 slated for 31 May 2007.
  - Very positive, with strong leadership consensus on way ahead.

Advisory Committee on Earthquake Hazards Reduction (ACEHR) Statutory Requirements

- Composition: At least 11 qualified members (no Federal employees) representing:
  - Research and academic institutions, industry standards development organizations, State and local governments, and financial communities; and,
  - All related scientific, architectural, and engineering disciplines

ACEHR Statutory Requirements

- Purpose is to Assess:
  - Trends and developments in science and engineering;
  - Program effectiveness;
  - Need for program revision; and,
  - Program management, coordination, and implementation activities.

ACEHR Statutory Requirements

- Report to NIST (ICC) Director at least once every two years on assessment and recommendations for improving the program.
- Consider USGS Scientific Earthquake Studies Advisory Committee (SESAC).

ACEHR

Members

Walter Arabasz – University of Utah

Jonathan Bray – UC Berkeley

Lloyd Cluff – PG&E

Dave Cook – Boeing

Rich Eisner – CA OES (retired)

Ron Hamburger – SGH

Jim Harris – JR Harris & Co

Howard Kunreuther – University of Pennsylvania

Tom O'Rourke – Cornell University

Chris Poland – Degenkolb (Chair)

Paul Somerville - URS

Kathleen Tierney – University of CO

Anne VonWeller – Murray, UT

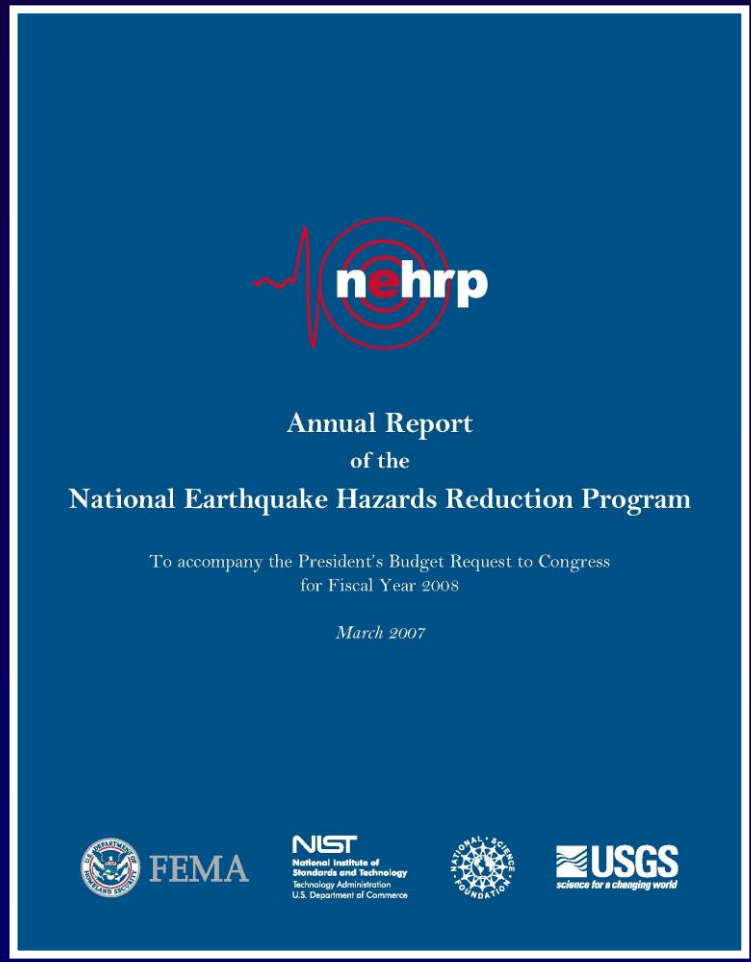
Yumei Wang – Oregon Dept of Geology & Mineral Industries

Sharon Wood – University of TX

USGS SESAC Chair (*ex officio*)
Currently Mark Zoback – Stanford University

Annual Report

- Format follows statutory requirements:
  - Current FY budgets for agencies, listed by "program activities"
  - Proposed next FY budgets for agencies, listed by "program activities"
  - Description of program activities and results for previous FY
  - Description of extent program has incorporated ACEHR recommendations
  - Description of activities carried out by program agencies that are related and supportive but not included in the program
  - Description of activities related to FEMA grants
- Combined FY 2005 / 2006 report under final review



Coordinated Interagency Budgets

- Ensures appropriate balance among “program activities.”
- Ensures consistency with priorities in Strategic Plan and with Administration priorities, considering funding levels authorized by Congress.
- Ensures integrity of budget data with NEHRP goals and objectives.
- Budgets to be reported at “Program Activity” level, as defined in reauthorization legislation.
- Coordinated budget to be submitted to OMB at time established by OMB for agencies to submit annual budgets.
- ICC to provide guidance to program agencies on preparation of budget requests (Senate Report 108-385).

Future Budget Planning

- Ensure consistency with Administration priorities established through work of NSTC Subcommittee on Disaster Reduction (SDR):
  - *Grand Challenges for Disaster Reduction*, June 2005.
  - *Grand Challenge* Implementation Plan for Earthquakes (Draft), June 2006 – in review.
  - Completed comparison of Strategic Plan and Grand Challenges in July 2006 – excellent correlation.
- Support Strategic Plan priorities, including:
  - FEMA: Performance-Based Seismic Design
  - NIST: Industry R&D roadmap, ATC-57, *The missing piece: improving seismic design and construction practices,* narrowing the "research-to-practice gap," to be closely coordinated with FEMA.
  - NSF: Priority given to NEES research and O&M, reflecting National Science Board-approved five-year cooperative agreement.
  - USGS: Priority given to ANSS and improved use of USGS information to reduce loss of life and property from catastrophic earthquakes.

Program Budgets

Agency	$M							
	FY 2005		FY 2006		FY 2007		FY 2008	
	Authorized[1]	Enacted[2]	Authorized[1]	Enacted[2]	Authorized[1]	Enacted[2]	Authorized[1]	Requested[3]
FEMA[4]	21.0	14.7	21.6	9.5	22.3	9.1	23.0	9.1
NIST	10.0	0.9	11.0	0.9	12.1	1.7	13.3	6.4
NSF[5]	58.0	53.1	59.5	53.8	61.2	54.8	62.9	55.7
USGS[6]	77.0	58.4	84.4	54.5	85.9	55.4	87.4	56.5
Totals	166.0	127.1	176.5	118.7	181.5	121.0	186.6	127.7

Notes:

1. Budgets authorized by Congress in Public Law 108-360.
2. Budgets reported by NEHRP agencies for FY 2005 – FY 2007.
3. Budgets for NEHRP agencies in President's FY 2008 budget Request in February 2007, except for FEMA.

   FEMA FY 2008 "requested" budget is estimated portion of President's FY 2008 DHS budget request that will be allocated for FEMA NEHRP activities.
4. FEMA FY 2005 actual budget covered program activities & S&E, but excluded state grants that are administered by DHS.

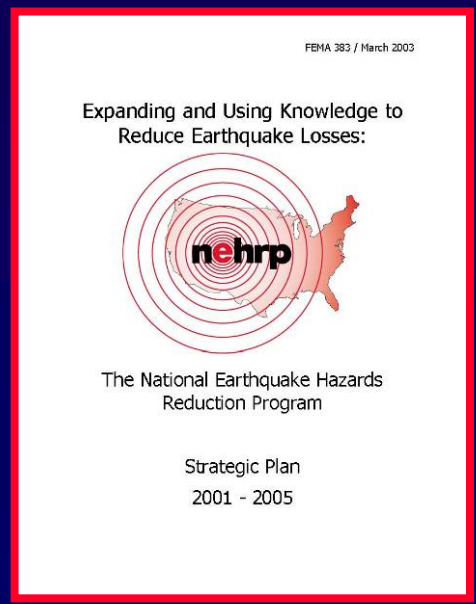
   FEMA FY06 & FY07 budgets cover program activities, but excludes S&E and state grants that are administered by DHS.
5. NSF budgets include NEES O&M funds: FY 2005 -$17.9M, FY 2006 - $20.3M, FY 2007 - $21.3M, FY 2008 - $22.2M.
6. USGS authorization includes for ANSS: FY 2005 - $30M, FY2006 and beyond - $36M per year.

   USGS FY 2005 actual budget includes funds for tsunami warning from emergency supplemental appropriation ($3.95M for EHP, $4.15M for GSN).

   USGS actual budgets include funds for GSN: FY 2005 - $7.5M, FY 2006 - $3.9M, FY 2007 - $3.9M.

Strategic Plan

- NEHRP agencies using 2006 stakeholder inputs and internal review results to update 2001-2005 plan (FEMA 383), creating new Strategic Plan, paralleling current reauthorization, which budgets through FY 2009.
- Emphasis on interagency synergy and areas of increased emphasis resulting from stakeholder inputs and internal reviews.
- Plan to be forward-looking in anticipation of future program developments.
- Draft plan currently under development.
- Draft plan to be available for ACEHR and stakeholder review before finalization.



Strategic Plan: May 2006 Stakeholder Inputs

- Establish performance metrics.
- Improve program integration.
- Improve program-wide funding, research, and implementation balance.
- Emphasize community-wide disaster resilience.
- Increase emphasis on lifeline issues.
- Improve communications (both ways – education/outreach and stakeholder inputs).
- Embed the social sciences in all aspects of program.
- Establish national repository for earthquake data.
- Place multi-hazard emphasis on research and implementation.
- Differing opinions:
  - Research-to-practice / “codification.”
  - Performance-Based Seismic Design (PBSD).

Strategic Plan: Emphasis Areas

Internal "gap analyses" of current Strategic Plan & stakeholder comments point to 8 areas of added emphasis for revised Strategic Plan:

- Develop advanced risk mitigation technologies and practices.
  - NIST implementation of "ATC Roadmap."
  - Modest FY 2007 startup, followed by more substantial proposed FY 2008 effort.
- Facilitate improved earthquake mitigation at state and local levels.
  - Reinvigorated FEMA grants program.
- Fully implement ANSS.
- Further develop techniques for evaluating and rehabilitating existing buildings.
  - Joint NEHRP/ATC/EERI workshop on research and implementation needs planned for late FY 2007.

Strategic Plan: Emphasis Areas

- Further develop Performance-Based Seismic Design (PBSD).
  - FEMA work with ATC to continue.
  - NIST to initiate research if requested FY 2008 funds are appropriated.
  - NEHRP research needs workshop planned for early FY 2008.
- Foster conducting future earthquake scenarios for key urban areas.
  - NEHRP workshop planned for late FY 2007 or early FY 2008.
- Develop a Post-Earthquake Information Management System.
  - Scoping effort planned by FEMA via NIBS and ALA.
  - Funding to be sought in future budgets.
- Increase consideration of socio-economic issues in both mitigation and response.

Strategic Plan Development: Goals Approach 1

Currently considering different approaches for plan structure

- Retain Stated Current Strategic Plan Goals:
  - Develop effective practices and policies for earthquake loss reduction and accelerate their implementation
  - Improve techniques to reduce seismic vulnerability of facilities and systems
  - Improve seismic hazard identification and risk assessment methods
  - Improve the understanding of earthquakes and their effects.

Strategic Plan Development: Goals Approach 2

- Organize IAW Statutory "Program Activities:"
  - Develop effective measures for earthquake hazards reduction.
  - Promote adoption of earthquake hazards reduction measures …
  - Improve the understanding of earthquakes and their effects … through interdisciplinary research …
  - Develop, operate, and maintain ANSS, NEES, and GSN

Strategic Plan Development: Goals Approach 3

- Potentially Use a New Format, Such As:
  - Achieve complete and applicable understanding of earthquake processes; earthquake effects on structures, lifelines, and communities; and of earthquake mitigation measures.
  - Record comprehensive earthquake data, deliver accurate and timely earthquake information, and provide valid and practical damage, hazard and risk assessments.
  - Develop advanced technologies and measures for application in cost-effective earthquake risk reduction.
  - Advance the adoption of earthquake risk reduction measures at all levels of government and in the public and private sectors.

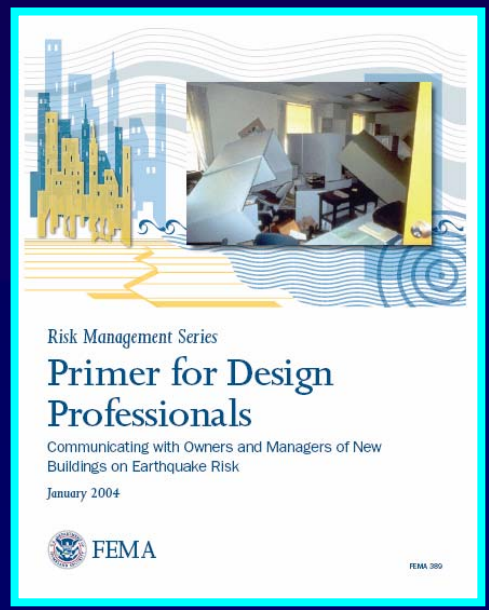
No decisions have yet been made!

Management Plan

- Statutory, to implement the Strategic Plan
- Viewed largely as an “internal” document governing operational activities.
- Covers upcoming and following fiscal years.
- Includes program milestones and performance metrics that implement Strategic Plan, fulfill statutory requirements (ICC, ACEHR, Annual Report, Consolidated Budget), and operate Secretariat.

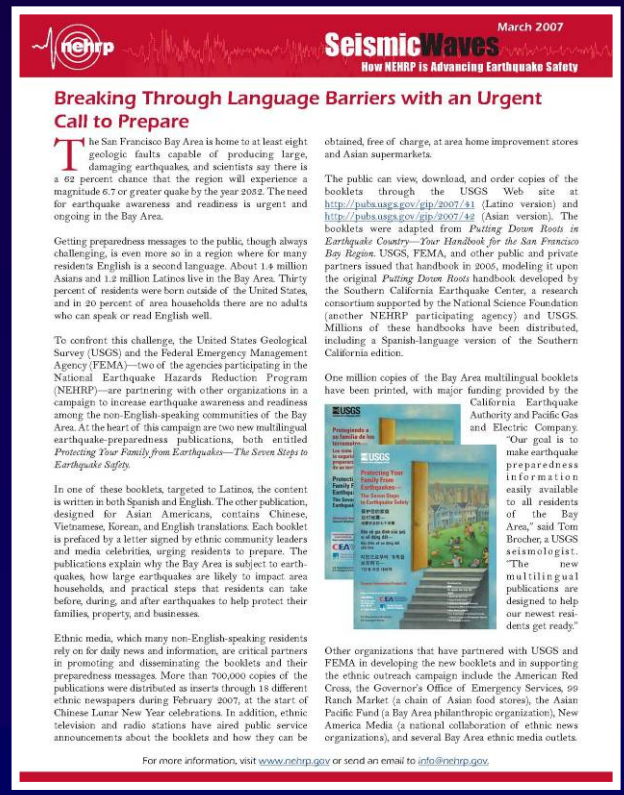
Other Areas of Collaboration

- Past and future post-earthquake investigations – see USGS Circular 1242
- Collaboration of NSF-sponsored researchers (including NEES facilities) and USGS researchers
- Transfer of NSF-sponsored socio-economic research into FEMA documents (e.g. FEMA 389)
- FEMA and USGS collaboration on HAZUS-MH



Conclusion

- 2004 NEHRP Reauthorization impacts:
  - Congress required program changes to increase interagency coordination & cooperation – Congress wants the whole of NEHRP to be more than the simple sum of its parts.
  - Congress mandated higher level and broader agency involvement through creating ICC and ACEHR.
- The Reauthorization presents an opportunity to foster interagency synergies that are needed to reduce National vulnerabilities to future major earthquakes even more effectively than in the past!
- Stakeholder interaction is a “must!”



nehrp March 2007

SeismicWaves

How NEHRP is Advancing Earthquake Safety

Breaking Through Language Barriers with an Urgent Call to Prepare

The San Francisco Bay Area is home to at least eight geologic faults capable of producing large, damaging earthquakes, and scientists say there is a 62 percent chance that the region will experience a magnitude 6.7 or greater quake by the year 2032. The need for earthquake awareness and readiness is urgent and ongoing in the Bay Area.

Getting preparedness messages to the public, though always challenging, is even more so in a region where for many residents English is a second language. About 1.4 million Asians and 1.2 million Latinos live in the Bay Area. Thirty percent of residents were born outside of the United States, and in 20 percent of area households there are no adults who can speak or read English well.

To confront this challenge, the United States Geological Survey (USGS) and the Federal Emergency Management Agency (FEMA)—two of the agencies participating in the National Earthquake Hazards Reduction Program (NEHRP)—are partnering with other organizations in a campaign to increase earthquake awareness and readiness among the non-English-speaking communities of the Bay Area. At the heart of this campaign are two new multilingual earthquake-preparedness publications, both entitled *Protecting Your Family from Earthquakes—The Seven Steps to Earthquake Safety.*

In one of these booklets, targeted to Latinos, the content is written in both Spanish and English. The other publication, designed for Asian Americans, contains Chinese, Vietnamese, Korean, and English translations. Each booklet is prefaced by a letter signed by ethnic community leaders and media celebrities, urging residents to prepare. The publications explain why the Bay Area is subject to earthquakes, how large earthquakes are likely to impact area households, and practical steps that residents can take before, during, and after earthquakes to help protect their families, property, and businesses.

Ethnic media, which many non-English-speaking residents rely on for daily news and information, are critical partners in promoting and disseminating the booklets and their preparedness messages. More than 700,000 copies of the publications were distributed as inserts through 18 different ethnic newspapers during February 2007, at the start of Chinese Lunar New Year celebrations. In addition, ethnic television and radio stations have aired public service announcements about the booklets and how they can be obtained, free of charge, at area home improvement stores and Asian supermarkets.

The public can view, download, and order copies of the booklets through the USGS Web site at http://pubs.usgs.gov/gip/2007/41 (Latino version) and http://pubs.usgs.gov/gip/2007/42 (Asian version). The booklets were adapted from *Putting Down Roots in Earthquake Country—Your Handbook for the San Francisco Bay Region.* USGS, FEMA, and other public and private partners issued that handbook in 2005, modeling it upon the original *Putting Down Roots* handbook developed by the Southern California Earthquake Center, a research consortium supported by the National Science Foundation (another NEHRP participating agency) and USGS. Millions of these handbooks have been distributed, including a Spanish-language version of the Southern California edition.

One million copies of the Bay Area multilingual booklets have been printed, with major funding provided by the California Earthquake Authority and Pacific Gas and Electric Company. “Our goal is to make earthquake preparedness information easily available to all residents of the Bay Area,” said Tom Brocher, a USGS seismologist. “The new multilingual publications are designed to help our newest residents get ready.”

Other organizations that have partnered with USGS and FEMA in developing the new booklets and in supporting the ethnic outreach campaign include the American Red Cross, the Governor’s Office of Emergency Services, 99 Ranch Market (a chain of Asian food stores), the Asian Pacific Fund (a Bay Area philanthropic organization), New America Media (a national collaboration of ethnic news organizations), and several Bay Area ethnic media outlets.

For more information, visit www.nehrp.gov or send an email to info@nehrp.gov.

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national earthquake hazards reduction program